REMARKS

Claims 1, 2, 4-8, 10-12, 14, and 15, all the claims pending in the application, stand rejected under 35 U.S.C. § 101. Specifically, the Office Action states that the claims do not produce a tangible (real world/non-abstract) result and only represent abstract ideas. The claims have been amended, above, to define: "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data." In addition, the preamble of the computer program claims has been amended to define a computer readable medium containing instructions executable by a computer.

With the claimed invention, each individual classifier is based on the partial view of the data that is locally available. For the decision made by the classifiers to be consistent, the data sets available to the classifiers are sampled from the same (fixed though unknown) distribution. A test pattern is assumed to be observable across the classifiers. A combined classification is achieved based upon the posterior probabilities computed by the individual classifiers. Therefore, the claims define "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data." The posterior is computed for a test sample based on the posteriors provided by a subset of consistent classifiers.

35 U.S.C. § 101 provides: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title. The Supreme Court has interpreted this statutory range of patentable subject matter to be quite broad. "In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Diamond v. Chakrabarty*, 447 U.S. 303, 308 [206 USPQ 193] (1980). "Congress included in patentable subject matter only those things that qualify as 'any ... process, machine, manufacture, or composition of matter, or any ... improvement thereof....'" *In re Warmerdam*,

33 F.3d 1354, 1358 (Fed. Cir. 1994) (quoting 35 U.S.C. § 101). The highly quoted statement in the legislative history of the 1952 Patent Act states that statutory subject matter includes anything under the sun that is made by man.

The Supreme Court has recognized two instances in which a method may qualify as a section 101 process: when the process "either [1] was tied to a particular apparatus or [2] operated to change materials to a 'different state or thing.'" *Cochrane v. Deener*, 94 U.S. 780, 787-788 (1877) ("A process is...an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing")). When a claim containing an abstract idea implements or applies that idea in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." *Diamond v. Diehr*, 450 U.S. 175, 192 (1981); see also *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972) ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."). Here, the claims define "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data" which is just such a transformation and reduction of an article to a different state or thing being discussed by the Supreme Court.

Since *Diehr*, the Federal Circuit has reviewed several computer technology cases, and in acknowledgment of the innovations occurring in this technological field, identified a third category of method claims that qualify as a "process." Extrapolating from the Supreme Court's "transformation and reduction of an article" test, the Federal Circuit has held that transformation of intangible subject matter (*i.e.*, data or signals) may also qualify as a § 101 process. *See, e.g., State Street*, 149 F.3d at 1373. Responding to the argument that process claims must recite a "physical transformation," the Federal Circuit in *AT&T* ruled that "physical transformation" "is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application." *AT&T*, 172 F.3d at 1358. Quoting the Supreme Court's language, "*e.g.*, transforming or reducing an article to a different state or thing" from Diehr, the *AT&T* court noted the usage of "*e.g.*" "denotes an example, not an exclusive requirement." *Id.* at

1359. *AT&T* went on to cite the transformation of intangible data signals in the method claim of *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), as an example that qualifies as a § 101 'process" in addition to the Supreme Court's test. *See id.* at 1359.

Accordingly, the Federal Circuit has consistently used its own "data transformation" test in assessing the eligibility of various machine-implemented claims. In *In re Alappat*, 33 F3d 1526, 1543 (Fed. Cir. 1994) the Court held that "data, transformed by a machine" "to produce a smooth waveform display" "constituted a practical application of an abstract idea." *State Street*, 149 F.3d at 1373. In *Arrhythmia*, the Court held "the transformation of electrocardiograph signals" "by a machine" "constituted a practical application of an abstract idea." *Id.* Likewise, in *State Street*, the Court held that "the transformation of data" "by a machine" "into a final share price, constitutes a practical application of a mathematical algorithm." *Id.* Thus, while *Diehr* involved the transformation of a tangible object - curing synthetic rubber – the Federal Circuit also regards the transformation of intangible subject matter to similarly be eligible, so long as data or signals represent some real world activity. Here, the claims define "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data" which is just the type of real world output being proffered by the Supreme Court and Federal Circuit.

Thus, the techniques of the presently claimed invention relate to pattern classification in a distributed environment where the data sets are vertically partitioned, in which each classifier can observe only a subset of the attributes in the data, and the classifiers do not share the data sets between themselves for reasons of privacy and security. More specifically, the claims provide "estimating posterior probabilities for the class labels of consistent classifier subsets; approximating the overall posterior probability of the partitioned data based upon the estimated posterior probabilities of the consistent classifier subsets." There can be overlap between the attributes available to different classifiers. One can also assume that each classifier has knowledge of which overlapped subset of attributes is shared by other classifiers. A classification decision is obtained based on the decisions made by the local classifiers, without imposing any master-slave configuration. In other words, no processor is able to "see" the entire data set. This

allows the claimed invention to "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data."

More specifically, the combined classification is based upon using the posterior probabilities computed by the individual classifiers. A decision is made based on the output of the individual classifiers. One estimates the posterior probability based on the posterior probabilities estimated by the individual classifiers. For a test sample, the overall posterior probability is approximated by combining the posterior probabilities provided by a subset of consistent classifiers. The combined posterior is obtained for a test pattern for each class, as described herein. The test pattern is assigned to the class for which the combined posterior is maximum. A classifier can compute the posterior for test sample using various existing techniques, using parametric or non-parametric techniques, for example.

The Overall approximated posterior is computed for a test pattern based only on the classifiers, which are consistent and the inconsistent classifiers are ignored. If, for a pattern, no classifier is consistent then only the product of the posteriors of all classifiers is taken.

Therefore, because independent claims 1, 6, and 7 define "producing a combined classification based upon said overall posterior probability; and outputting said combined classification to classify said vertically partitioned data" it is Applicants position that such claims define patentable subject matter under 35 U.S.C. §101 and their dependent claims similarly define patentable subject matter. In view of this, the Examiner is respectfully requested to withdraw this rejection and to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

Dated: 05/22/08   \Frederick W. Gibb, III\

Frederick W. Gibb, III
Registration No. 37,629

Gibb & Rahman, LLC
2568-A Riva Road, Suite 304
Annapolis, MD 21401
Voice: (410) 573-1545
Fax: (301) 261-8825
Customer Number: 29154